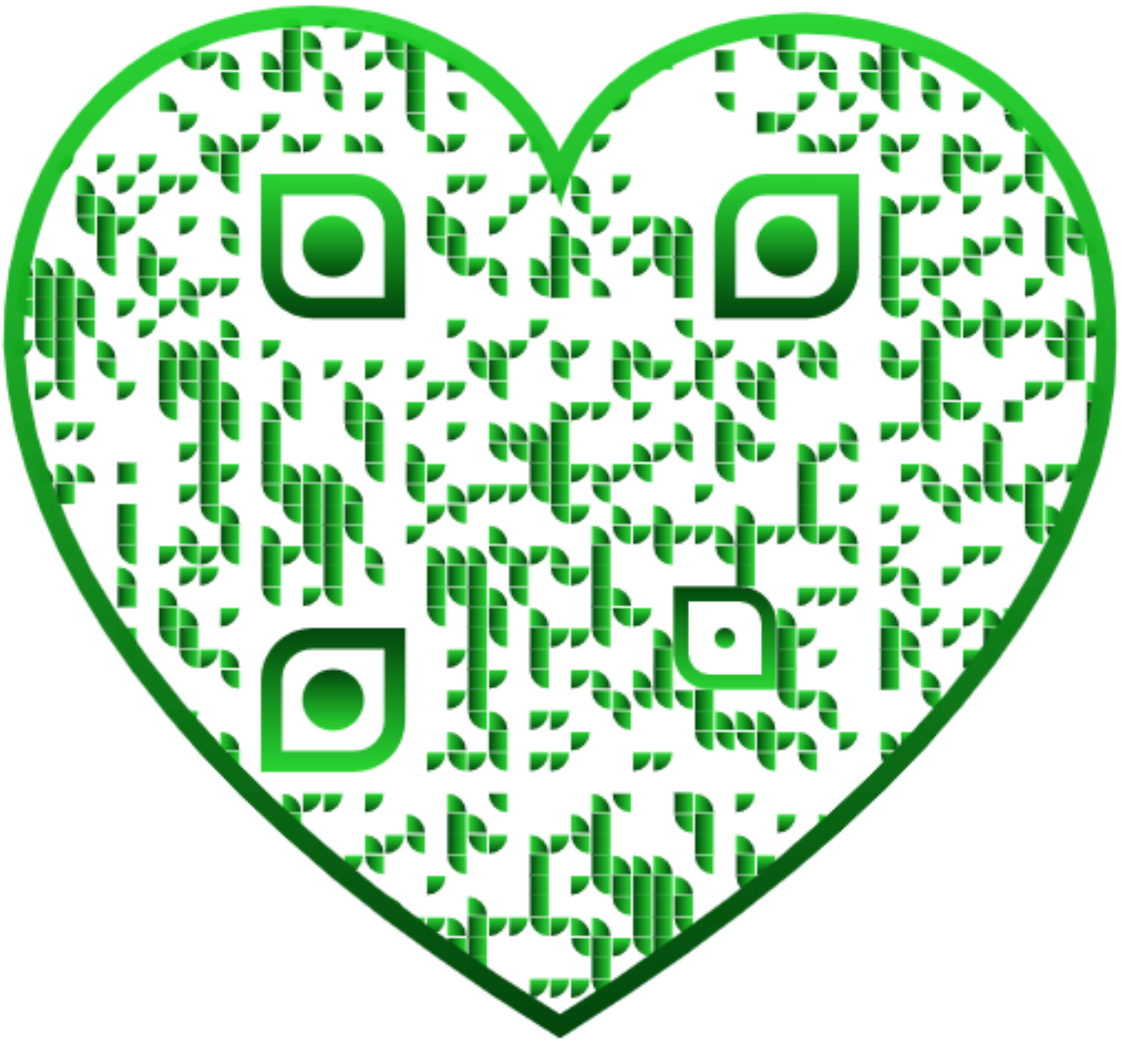
Labour analgesia

- ***Dr hamdi abu sharqih***
- ***anesthesologist***



DEFINITION OF LABOUR

'LABOUR can be defined as spontaneous painful uterine contractions associated with the effacement and dilatation of the cervix and the descent of the presenting part'.

labor pain is one of the most intense pain that a woman can experience.

- **labor pain is one of the *most intense* pains that a woman can experience, and it is *typically worse than* a pain associated with a deep laceration.**

- ***60%* of primiparous women described the pain of uterine contraction as *unbearable, intolerable, extremely severe, or excruciating*.**

Analgesia for Labor and Delivery

- ALWAYS controversial !
- "Birth is a natural process"
- Women should suffer!!
- Concerns for mother's safety
- Concerns for baby
- Concerns for effects on labor

Benefits of NVD for mothers

- ***Maintaining the muscles of the uterus and the woman's reproductive system.***
- **Protecting the mother from developing high blood sugar or any viral infection.**
- **The mother can breastfeed her baby and recover quickly without feeling severe pain.**
- ***allows the mother to communicate with her newborn in a shorter period than a cesarean section, and to begin breastfeeding him.***
- **the newborn receives a dose of beneficial bacteria to build the immune system and digestive system.**
- **Natural birth contributes to the release of a protein in the brain that improves the growth of the fetus and helps develop its mental abilities.**
- **NVD helps the baby get rid of the fluids in the lungs, thus preventing him from having Respiratory diseases.**

Benefits of NVD for mothers

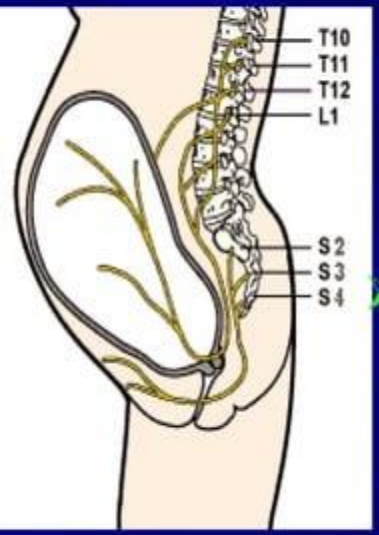
- ✓ **Three times less likely to die during delivery**
- ✓ **Shorter hospital stay**
- ✓ **Shorter recovery time**
- ✓ **Avoidance of major surgery and its associated risks**
- ✓ **Shorter-lasting pain**
- ✓ **Shorter-lasting soreness**
- ✓ **Sooner breast feeding**
- ✓ **Less physical complaints after delivery**
- ✓ **Lesser risk of future pregnancy complications**
- ✓ **Avoidance of postoperative complications**
- ✓ **Avoidance of postanesthesia complications**
- ✓ **• Boost of the immune system**
- ✓ **• Protection of intestinal tract**
- ✓ **• Less likely to have breathing problems at birth and even during childhood, such as asthma**

In the United States

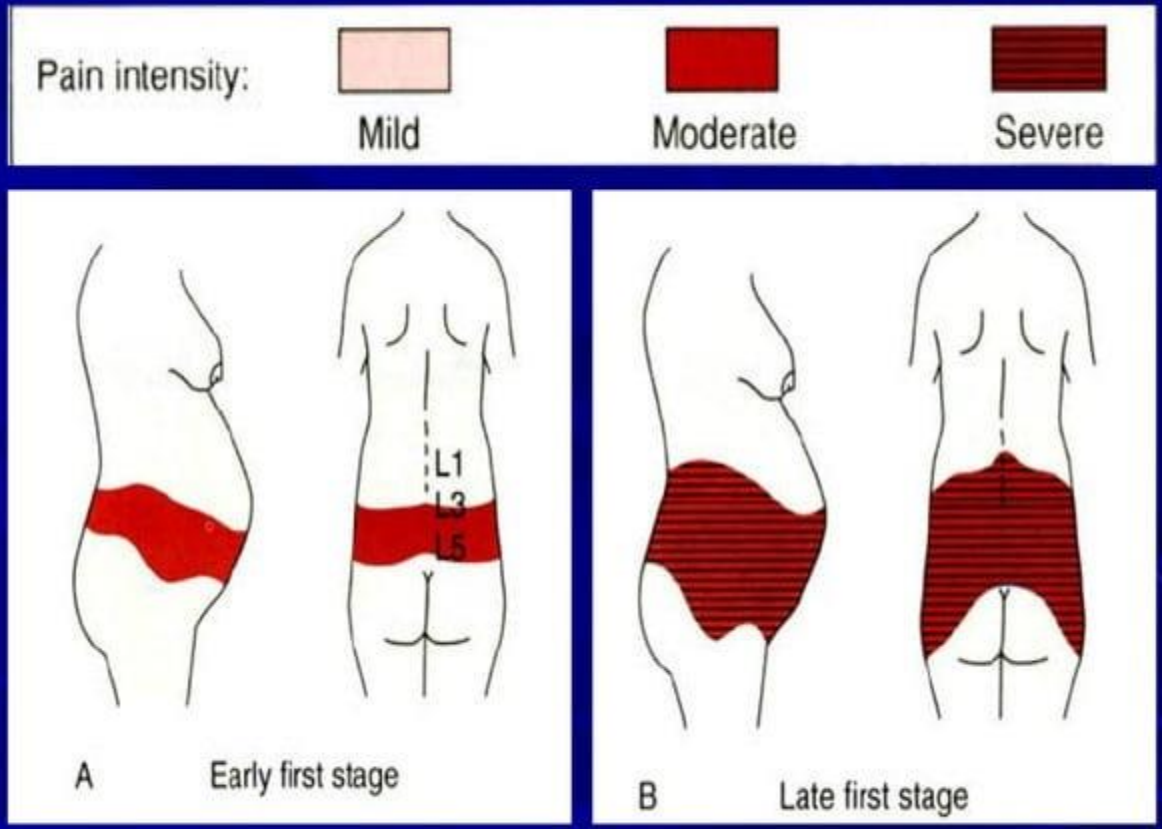
According to newly released Medscape data approximately 60% of laboring women (2.4 million each year) choose regional analgesia for pain relief during labor.

R. Aminnejad, MD.

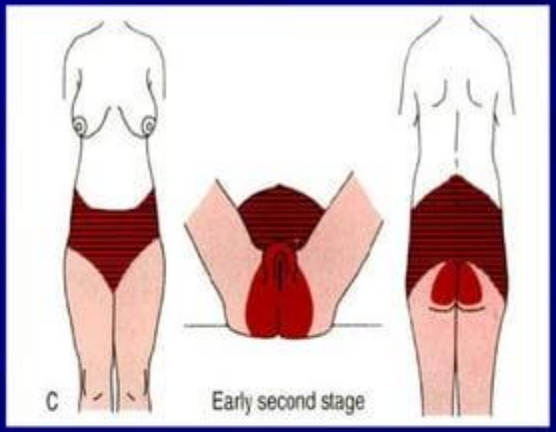
PAIN PATHWAYS

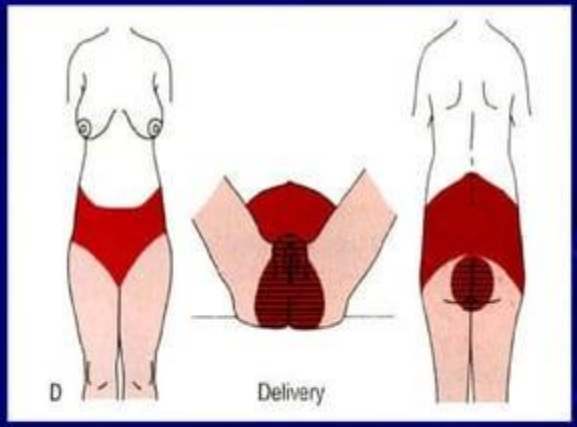


- 1st stage of labor – mostly visceral
  - Dilation of the **cervix** and distention of the **lower uterine segment**
  - Dull, aching and poorly localized
  - Slow conducting, C fibers, T10 to L1
- 2nd stage of labor – mostly somatic
  - Distention of the **pelvic floor, vagina and perineum**
  - Sharp, severe and well localized
  - Rapidly conducting, A-delta fibers,S2 to S4

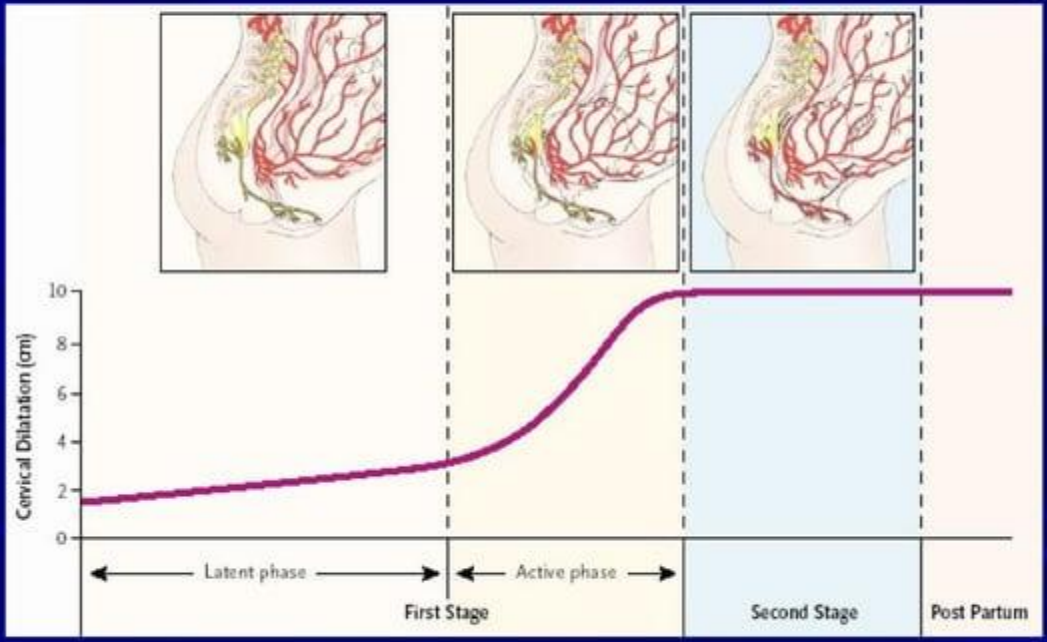

Pain intensity:
Mild
Moderate
Severe
L1
L3
L5
A
Early first stage
B
Late first stage

Pain intensity:
Mild
Moderate
Severe


C
Early second stage

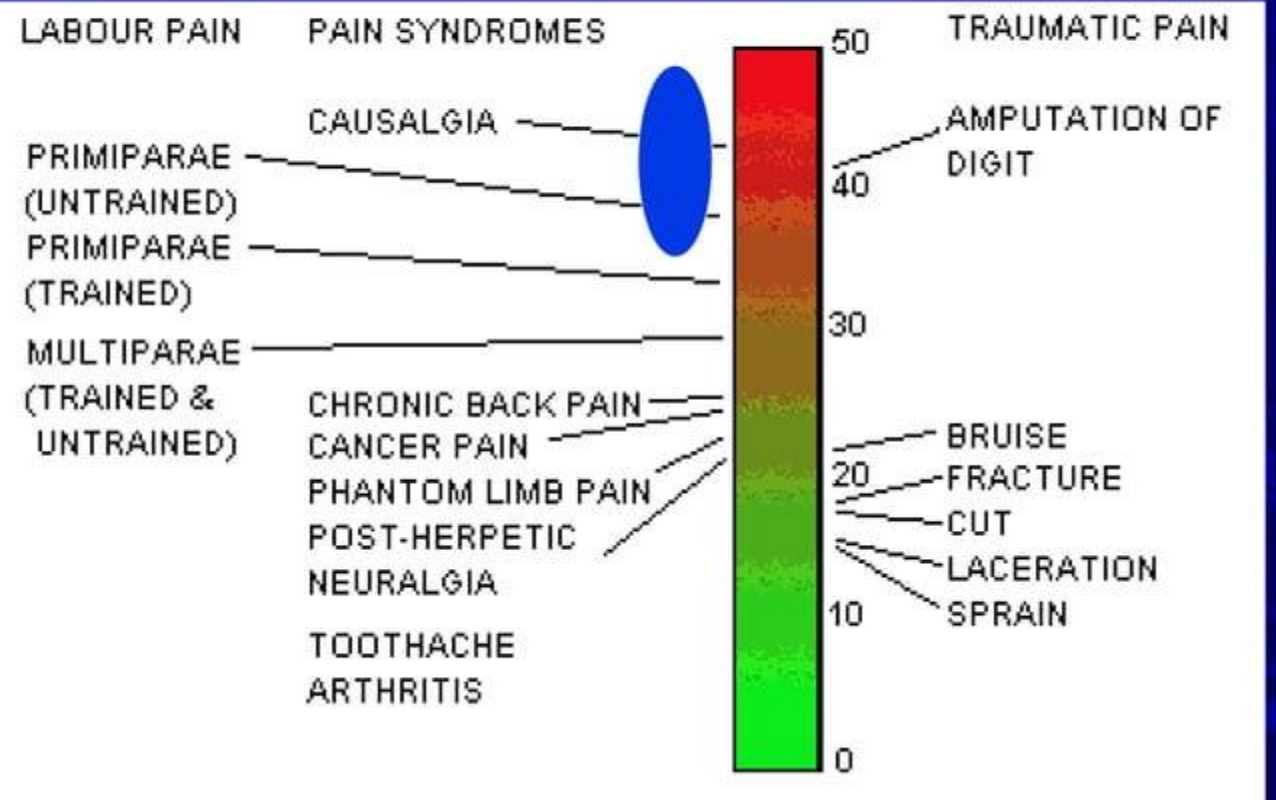

D
Delivery

Labor Pain & Stages of Labor



Eltzschig, Leiberman, Camann, NEJM 348; 319:2003

Grading Of Pains



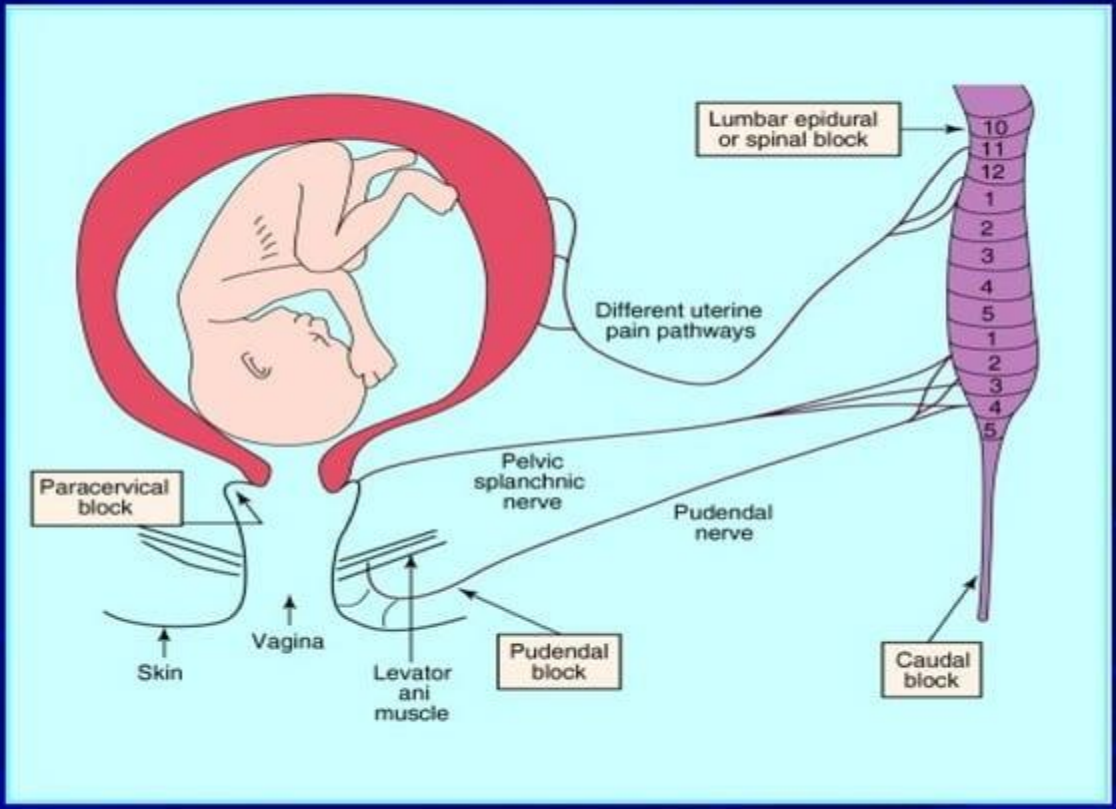
Effects of labor pain

- Maternal hyperventillation
- Hypocarbia – Uteroplacental vasoconstriction
  - ODC to left
- ↑O2 consumption
- ↑Cardiac output, ↑BP
- ↑Maternal plasma catecholamines

Fetal acidosis and hypoxia

Ill effects Of Pain?

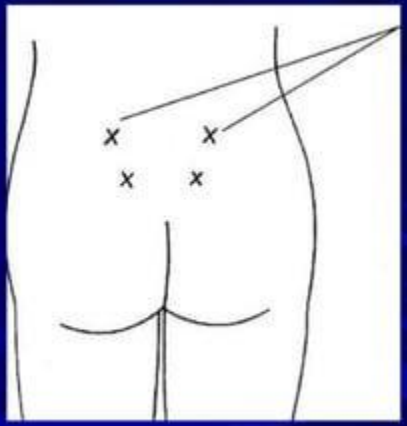
- High risk parturient – Pre-eclampsia
  - Cardiac disease
  - Asthma
- Marginal uteroplacental circulation
- Prolonged labor


Lumbar epidural or spinal block
10
11
12
1
2
3
4
5
1
2
3
4
5
Different uterine pain pathways
Pelvic splanchnic nerve
Pudendal nerve
Paracervical block
Skin
Vagina
Levator ani muscle
Pudendal block
Caudal block

Labor Analgesia
Non-Pharmacological
Pharmacological

Non-Pharmacological

- Psycho prophylaxis – Lamaze, Doula
- TENS
- Acupuncture
- Hydrotherapy
- Intradermal water inj.



ACUPUNTURE

- Generally two local points and two distal points on the arms or on the legs are selected.

Begin Acupuncture 4 weeks before the expected time of delivery.

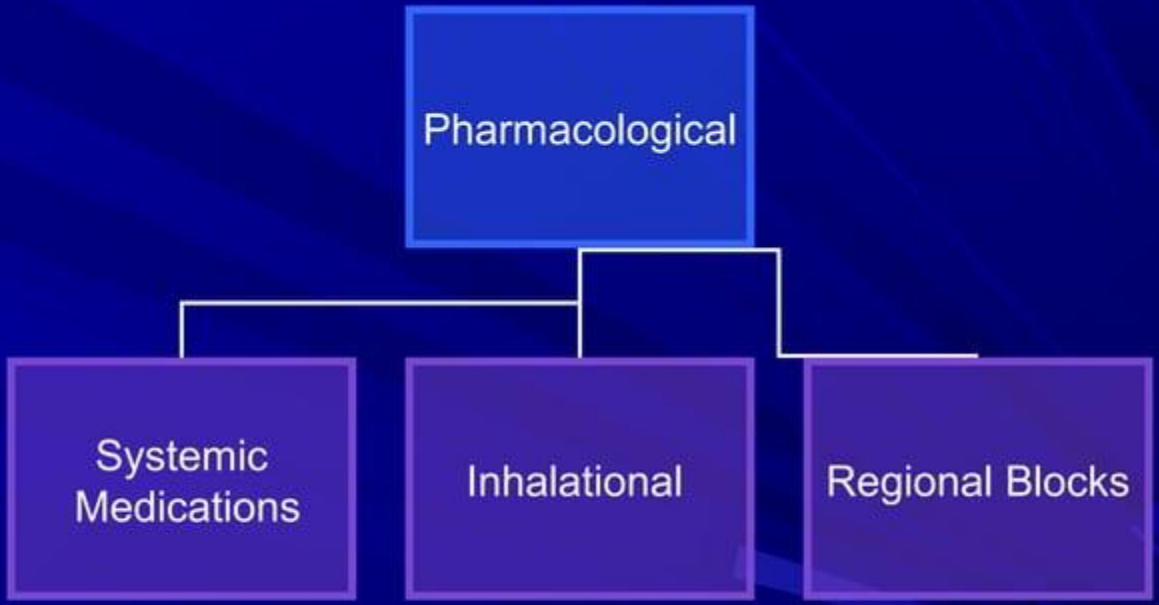
Needles are placed once a week using the specific points.

- *Points*

LI.4 Hegu, SP.6 Saninjiao, Extra Neima
PC 6 (Neiguan), Du.20,Du.2,Du6, GB.21, He.7(shenmen)

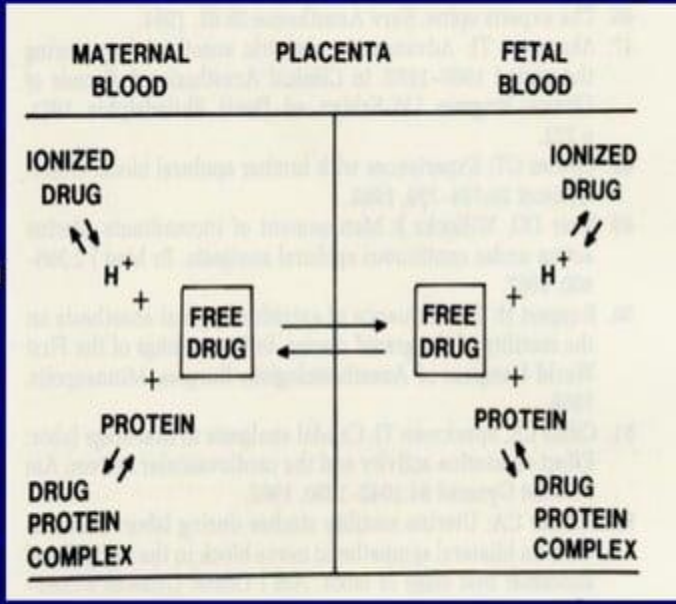
TENS

- Beneficial in patients with moderate to severe contraction pains in an otherwise reasonably normal labor.
- Very popular in Europe.
- Easy to apply, non-toxic and frequently effective.
- 4 electrodes are placed one on either side of the spine in the lower thoracic region (T 10) and one on either side of the spine in the sacral area.
- The patient may control up to 3 levels of intensity of stimuli, and she can switch it off if she wishes.


Pharmacological
Systemic Medications
Inhalational
Regional Blocks

Factors Determining Fetal Drug Levels

- Lipid solubility
- Molecular size
- Total dose of drug
- Concentration gradient
- Maternal metabolism and excretion
- Degree of ionization
- pKa of drug, maternal and fetal pH
- Protein binding - mother and fetus
- Uterine blood flow
- Time for equilibrium to occur



Placental Transfer of Drugs

- Factors that promote rapid diffusion include the flowing:
  1-Low molecular weight < 600 Daltons .
  2-High lipid solubility .
  3-Low degree of ionization .
  4-Low protein binding .

Systemic Opioids - Disadvantages

- Placental transfer
- Inadequate pain relief
- Maternal sedation
- Nausea, vomiting, gastric stasis
- Fetal heart rate effects:
  - Loss of beat-to-beat variability
  - Sinusoidal rhythm
- Dose-related maternal / neonatal depression
- Newborn neurobehavioral depression

Potential Fetal/Neonatal Effects

- Low 1 and 5 min Apgar scores
- Respiratory acidosis
- Naloxone/ ventilatory assistance may be needed
- Neurobehavioral depression - dose dependent
- Occasionally, prolonged observation in NICU needed

- Mepridine: 50-100mg IM / 25-50mgIV
  onset: 45mins / 5mins
  neonatal depr: 3hrs / 20 mins
  optimal time: >4hrs / <1hr

- Fentanyl: 50-100µg/hr, peaks @ 3-5mins
- Remifentanil : ½life 6mins, 0.5mirogms/kg
- Butraphanol, Nalbhuphine, Phenothiazines

Inhalational Analgesia

- Isoflurane (0/2%)
- Enflurane (0/2%)
- Desflurane (0/2%)

LIMITED USE

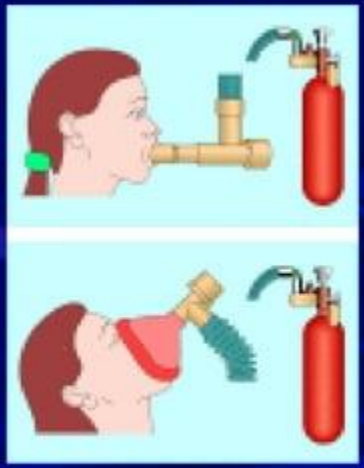
Drowsiness ,Unpleasant smell, High cost,
Accidental overdose

Inhalation Analgesia

Entonox (N_2O:O_2 = 50:50), %,

Advantages:

- Easy to administer (no needles or PDPH)
- "Satisfactory" analgesia variable
- Minimal neonatal depression



Inhalation Analgesia

Disadvantages:

- Decreased uterine contractility (except N_2O)
- Rapid induction of anesthesia in pregnancy
- Risk of unconsciousness and aspiration
- Difficulties with scavenging in labor rooms

What is Painless Delivery?

Painless delivery can be achieved using a form of regional anaesthesia that provides pain relief during natural labour.

Epidural anesthesia .

Single shout S/A .

What NEED.”””

Equipment's ; epidural set .

Spinal needle.

Monitoring . Drugs,

Experience’

The Ideal Labor Analgesic

- Good pain relief
- No autonomic block (no hypotension)
- No adverse maternal or neonatal effects
- No motor block
- No effect on labor and delivery:
  - No increase in C/S rate
  - No increase in forceps/vacuum delivery
- Patient can ambulate
- Economical: cost and personnel

Advantages of Regional Analgesia or Painless Normal Delivery –

1. **Less postpartum complications: By alleviating pain, it allows the mother to focus on the delivery. It is an aid for relaxation and can prevent exhaustion and irritation experienced by most women during childbirth, thereby reducing the risk of developing postpartum complications.**
2. **Relaxes the muscles while delivery: Epidural analgesia and single shot helps the baby descend easily by relaxing the pelvic and vaginal muscles.**
3. **Lowers blood pressure of the mother: It also helps in lowering the blood pressure of the mother, which otherwise can rise to dangerous levels during Laboure.**
4. **Beneficial for mothers with cardiac complications: Heavy pain may affect those mothers who have a history of cardiac complications or who are experiencing heart problem. In such cases, the painless delivery will be favourable.**

5. Less secretion of stress hormones: Due to the excessive torment and pain, the mother secrets more stress hormones which cause a great deal of irritation and distress to the child as well as the mother. Since, Epidural analgesia reduces the pain and torment, the amount of hormones produced will be very less and hence, both mother and child can be comfortable.

Neuraxial Blocks - advantages

- Most effective & Least depressant
- Great versatility – Extent & Duration
- Reduces maternal Catechols
- ↑Intervillous blood flow

- ***Improved Uteroplacental perfusion***
- Low dose LA – *NO Effect on Uterine activity*
- Low dose opioids – *NO neonatal depression*

Regional Analgesia - Neonatal Effects

- Uterine perfusion maintained
- FHR changes:
  - baseline variability
  - periodic decelerations (due to↓ maternal catechols?)
- Apgar scores, acid-base status - unaffected
- Neurobehavioral effects absent
- LA toxicity - *extremely* rare
- Profound hypotension - possible fetal compromise

Contraindications to epidural analgesia in labor	Indications for epidural analgesia
• Maternal refusal • Bleeding disorders • Sepsis in the lumbar area and systemic sepsis • Local infection → epidural abscess. • systemic infection or systemic inflammatory response syndrome (SIRS)	• Maternal request • Occipitoposterior presentation • pre-eclampsia • Prematurity or IUGR • Intrauterine death • Induction of labor • Instrumental or caesarean delivery likely Previous caesarean delivery • Presence of significant concurrent disease (e.g. heart disease,diabetes, hypertension) • Twin pregnancy

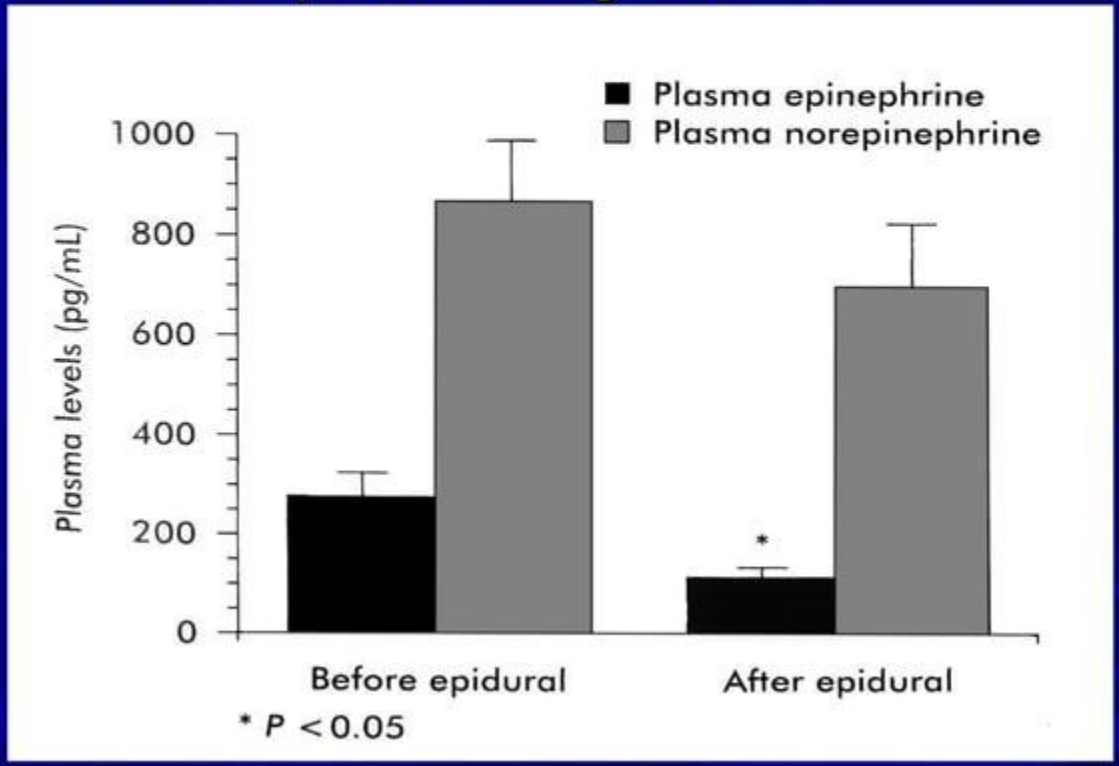
Particularly beneficial

- Hypertensive disorders
- Cardiac disease
- Asthma
- Diabetes
- Prolonged lobor/ Oxytocin augmentation
- Prematurity
- Multiple gestation
- Vaginal breech delivery

Blunts Haemodynamic response

Depressant effects of opioids avoided

Maternal catecholamines decrease during labor after lumbar epidural analgesia.



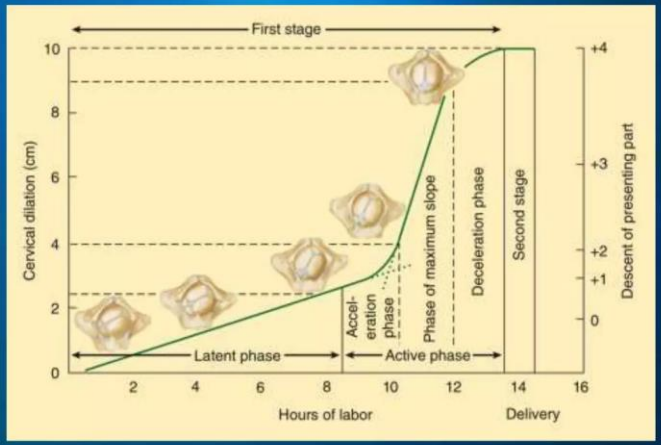
Am J Obstet Gynecol 1983;147:13-5.

GOALS OF LABOR ANALGESIA

- Dramatically reduce pain of labor
- Should allow parturients to participate in birthing experience
- Minimal motor block to allow ambulation
- Minimal effects on fetus
- Minimal effects on progress of labor

Neuraxial Analgesia

- Timing of placement
  - Current ASA guidelines note that maternal request for labor pain relief is sufficient justification for intervention and the decision should not depend on an arbitrary cervical dilation.



Neuraxial Blocks

- Spinal opioids alone: very high risk pts
- Epidural opioids alone: High doses
- Spinal LA alone: Saddle block, 6mg bupivacaine

- Epidural LA alone
- Epidural LA + Opioid ± Adjuvants
- Combined Spinal & epidural – LA+Opioid ± Adjuvants
- Continuous spinal – LA ± Opioids

Choice Of Local Anesthetic

- Rapid onset with minimal motor block
- Minimal risk of maternal toxicity
- Negligible effects on uterine activity and uteroplacental perfusion
- Limited uteroplacental transfer
- Long duration of action

Walking Epidural

- Also called ambulatory epidural.
- Also called minimal motor block epidural
- Low dose CSE opioid analgesia because motor function maintained and the ability to walk not impaired.
- Any neuroaxial analgesia technique allowing safe ambulation
- Methods:
- CSE: Queen Charlotte regimen
- Intrathecal-12.5 to 25mcg of fentanyl + 2.5 mg of 0.5% bupivacaine
- Epidural- 0.0625% bupivacaine + 2mcg/ml fentanyl {10ml}

Single Shot Spinal Analgesia

- Can provide immediate pain relief for immediate delivery.
- Suitable in very early labor to enable epidural placement under more controlled conditions
- Multiparous- suitable candidate due to rapid labor progression
- For instrumental deliveries in women who do not have an indwelling epidural catheter
- Opioid alone or low dose LA + opioid

AGENTS	DOSE	DURATION
Fentanyl	15-25mcg	85-95 min
Sufentanyl	5-10mcg	105-115 min
Bupivacaine	2.5mg	60 min

Methods

❖ *The prospective open-label study was conducted on 100 parturients. Group S (N = 50) received intrathecal injection of 0.5 ml of heavy bupivacaine (2.5 mg) and 0.5 ml of fentanyl (25 µg), and 1 ml of preservative free morphine (250 µg/ml) was given (total volume of 2 ml) using 26 G Quincke spinal needle Group C (N = 50) were managed according to the institutional protocol of programmed labor for normal vaginal delivery. The duration of analgesia, VAS score, safety and side effects, and progress of labor was noted and compared.*

❖ **Results: The progress of labor, mode of delivery, and fetal parameters was similar in both the groups. But the parturients in the group S had lower VAS score with a pain-free period of 238.96 ± 21.88 min, without any noted side effects**

❖ ***Conclusion:** Single-dose intrathecal analgesia with heavy bupivacaine 2.5 mg + fentanyl 25 µg + morphine 250 µg can be used efficaciously covering the complete duration of labor in both primigravida and multigravida with no increase in instrumental delivery or C-section rate or other side effects.*

Single shot spinal analgesia

❖ **The Drugs**:

- **Bupivacaine .**
- **Fentanyl .**
- **preservative free morphin**
- **DEXMEDETOMIDINE**

❖ **The Equipments :**

- **. Spinal needle NO 25 ,26 ,2**
- **. sterile gauzes**
- **. povidone**
- **.Aspirt**

❖ **The position:**

- **. Sitting**

❖ **The monitoring:**

- ***. Simple monitoring like***
- ***Spo2***
- ***B/P***
- ***CTG.***
- ***IV fluids like DND or R/L 500ml to 1000 m***

Single-dose spinal analgesia: a safe and effective method of labor analgesia for parturients in low resource areas

- ***What s advantages its over epidural catheter?***
- ✓ ***1- easy***
- ✓ ***2- available***
- ✓ ***3- unexpansive***
- ✓ ***4- effective***
- ✓ ***5- no complications***

Monitoring

- Measure BP every 1-2 min for first 10 min, then every 5-15 min during the infusion and until the block wears off.
- Monitoring: partogram- uterine contractions, FHR, cervical dilatation, i/v fluids, urinary output
- Patient should turn from side to side every 30 mins to avoid one sided block
- Check regularly for sensory level, adequacy of analgesia and motor block

Side effects of IT opioids

- Nausea, Vomitting
- Pruritis
- Sedation
- At very high doses - Resp depression
  - Fetal bradycardia
- Stratergy to ↓ side effect - Add LA
  - Lowest dose opioid

Complications

- Hypotension: preloading, LUD, O2, fluid, ephedrine
- Inadequate analgesia:
- Unintentional intravascular placement:

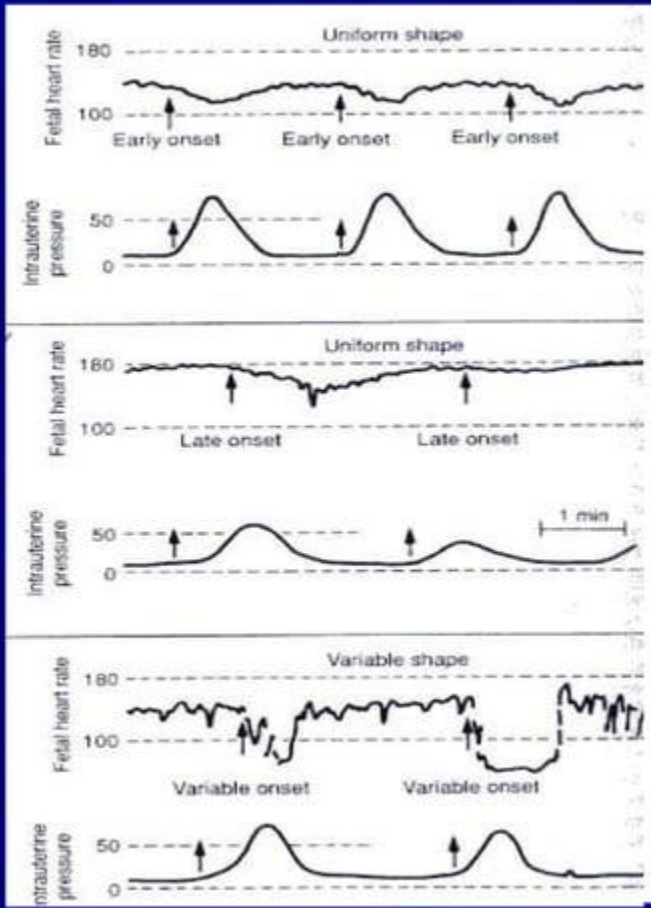
  slow injection of dilute conc – less risk

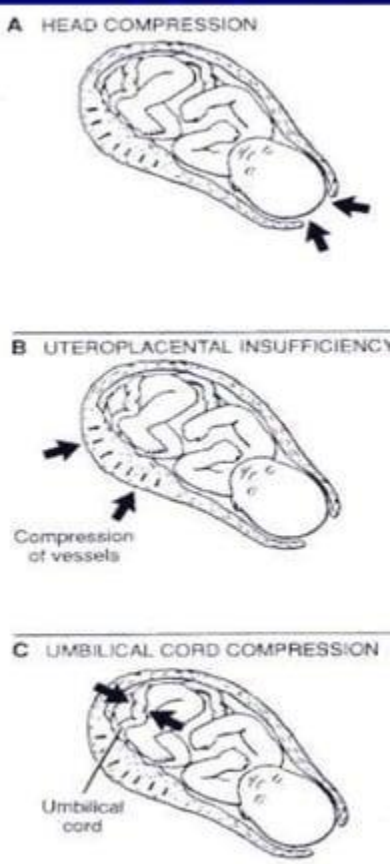
  ligonocaine – light headedness, perioral numbness, seizures.

  Bupivacaine – Ventricular arrythmia, cardiac arrest
- Unintentional intrathecal placement:

  Hypotension, total spinal, PDPH
- Subdural placement :patchy block, high level

Fetal Heart Rate





Management of FHR Changes

- Left uterine displacement
- Maternal position change
- O_2 administration
- STOP OXYTOCIN!
- Fetal scalp stimulation
- Nitroglycerin: 400 µg sublingual X 2 (or more)
- Terbutaline 0.25 mg, subcutaneous
- Treat hypotension
- Ephedrine - ↑ epinephrine level; ↑ UBF

Conclusion

- ***Single-shot spinal with heavy bupivacaine 2.5 mg + fentanyl 25 µg + morphine 250 µg (total volume 2 ml) .***

Or with

Bupivacaine 0.5% =1ml = 5mg.

Fentanyl 0.5 ml =25ug .

NS or DW 0.5 ml .

Adrenaline 10 - 20 ug

Total dose = 2,1 ml

- ***can be used effectively covering the complete duration of labor in both primigravida and multigravida with no increase in instrumental delivery or C-section rate and without any prolongation of labor or other side effects. The only limiting side effect noted was motor weakness which lasted for a maximum of 30 min.***

WHY LABOR ANALGESIA IS NOT POPULAR?

- Unavailability of Anaesthetist
- Unavailability of Equipments
- Non co-operative Obstetrician
- Unawareness of People

Thank you for attendance